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ORIGINAL RESEARCH

COMPARISON OF SCAPULAR MUSCLE ACTIVATIONS DURING THREE OVERHEAD THROWING EXERCISES

Lisa Henning, MEd[1]
Hillary Plummer, PhD, ATC, LAT, CES[2]
Gretchen D. Oliver, PhD, FACSM, ATC, LAT, CES[1]

ABSTRACT

Background: With shoulder pain and injury on the rise in overhead athletes, clinicians are often examining preventative exercises to address functional abnormalities. Because shoulder impingement is prevalent in overhead athletes, much focus is on scapular stability and the function of the stabilizing force couple of the upper and lower trapezius and serratus anterior.

Hypothesis/Purpose: The purpose of this study was to examine scapular muscle activation during a series of throws and holds (throwing without releasing) with two different ball weights (7oz and 12oz). It was hypothesized that the holds exercises would elicit greater activation of the scapular musculature than the throw, irrespective of ball weight.

Study Design: Case control laboratory study

Methods: Twenty-two NCAA Division I, right hand dominant, softball players (19.91 + 1.04 years; 169.24 + 7.36 cm; 72.09 + 10.61 kg) volunteered to participate. Surface EMG was utilized to measure muscle activity in the upper, middle and lower trapezius and serratus anterior muscles during three different throwing activities.

Results: MANOVA results revealed no significant differences in muscle activity between throwing conditions, $F_{(16,82)} = 1.02$, $p = 0.446$, Wilks' $\Lambda = 0.696$, Cohen's $d = 0.44$ (7oz holds), 0.24 (12oz holds), power = 0.625.

Conclusion/Clinical Relevance: The results may provide some clinical insight in advocating the use of holds with different ball weights. The holds throw may be an effective step in shoulder strengthening that can more closely mimic the functional movement of throwing without the element of ball release.

Levels of Evidence: Level 3

Keywords: Baseball, injury, kinetic chain, rehabilitation, softball, upper extremity

CORRESPONDING AUTHOR
Gretchen D. Oliver
301 Wire Rd
Auburn University
Auburn, AL 36849
859-200-4035
E-mail: goliver@auburn.edu

[1] Sports Medicine and Movement Laboratory, Auburn University, School of Kinesiology. Auburn AL
[2] Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA, USA